was ever known to return to the land of cakes not plum—but oats.

As Davy's greatest discovery was Faraday, so it may be said that Playfair's was Dewar, who acted for some time as his assistant. The five months' duties of the Edinburgh chair did not by any means exhaust his energies. On the occasion of the second great exhibition of 1862, his services were again called for, and in 1868 he was returned to Parliament in the Liberal interest as representing the Universities of Edinburgh and St. Andrews, a seat which he held for seventeen years. His Parliamentary labours were arduous and important, and his name will go down as representing the reorganisation of the Civil Service. He also presided over many important Committees and Royal Commissions; indeed, it may be said that for many years no official inquiry was considered satisfactory without the advice of Playfair, whose clear head and common sense were always readily placed at the service of the nation. He was Postmaster-General in Gladstone's ministry of 1873, and on the return of the Liberals to power in 1880 he was elected Chairman of Ways and Means, a post which in those stormy days was no sinecure. At the election of 1885, finding his Liberal views did not coincide with those of the University constituencies, he offered himself as a candidate for South Leeds, and was returned also in 1886 and 1892. He was Vice-President of the Council during Mr. Gladstone's short administration of 1886, but was not offered office in 1892, but received the honour of a peerage, which was given him more for his political than his scientific eminence. Playfair was the last remaining original member of the Chemical Society. The banquet which was to have been given in his honour and in that of the other past presidents of fifty years' standing has had to be postponed owing to his somewhat sudden death.

It is to him that we owe the first movement with regard to technical instruction, and his name will go down to posterity as one "who loved his fellow men."

He was laid to rest at St. Andrews, the city from which his family sprang. His merit was recognised by representatives of the Queen and of the Prince of Wales, and numerous friends and admirers, both scientific and political, as well as by the citizens of St. Andrews.

H. E. R.

OSBERT SALVIN, F.R.S.

ORNITHOLOGY and entomology have sustained a great loss by the death of Mr. Osbert Salvin, which occurred on the 1st inst. at his beautiful residence Hawksfold, near Haslemere. The second and only surviving son of the late Mr. Anthony Salvin, the well-known architect, he was born in 1835, and received his education at Westminster and Trinity Hall, Cambridge, where he graduated as a Senior Optime in the Natural Science Tripos of 1857. Immediately after taking his degree he, together with Mr. W. H. Hudleston (then Simpson), joined Mr. (now Canon) Tristram in his natural history exploration of Tunis and Eastern Algeria, where they passed five months. In the autumn of the same year Mr. Salvin proceeded to Guatemala, where, chiefly in company with the late Mr. G. U. Skinner, the celebrated collector of orchids, he stayed till the middle of 1858, returning to Central America (henceforth always to be associated with his name) about twelve months later. He again went out in 1861, accompanied by Mr. Frederick Godman, and continued the explorations he had already begun, but was home again in 1863. In 1865 he married Caroline, the daughter of W. W. Maitland, Esq., of Loughton in Essex, and with her subsequently undertook another voyage to Central America. In 1874, on the foundation of the Strickland Curatorship in the University of Cambridge, he accepted that office, which he filled until 1883, when, on his father's death, he succeeded to the property at Hawksfold, and removed thither, though there was scarcely a week in which he did not pass some days in London; for with Mr. Godman he had conceived the idea of bringing out a "Biologia Centrali Americana," being a complete natural history of the countries lying between Mexico and the Isthmus of Panama. This gigantic task, by far the greatest work of the kind ever attempted, taxed all their united efforts, and those of the many contributors they enlisted, and is still in progress. Before beginning this, Mr. Salvin had edited the third series of the *Ibis*, of which he was one of the founders, and had brought out a "Catalogue of the Strickland Collection" in the Cambridge Museum. He contributed also the *Trochilidæ* (Humming-birds) and *Procellariidæ* (Petrels)—on which he was the acknowledged authority—to the British Museum "Catalogue of Birds," and almost his latest labour was that of completing and arranging the late Lord Lilford's "Coloured Figures of British Birds"; while the Royal Society's "Catalogue of Scientific Papers" enumerates forty-seven published by Mr. Salvin alone, twenty-three by him and Mr. Godman jointly, and fifty-four by him and Mr. Sclater—all before 1884.

Mr. Salvin was a Fellow of the Royal, Linnean, Zoological and Entomological Societies, on the Councils of each of which he frequently served; and it may be truly said that there were few naturalists whose opinion was more often sought, for his advice was generally sound. His figure was well known at the Athenæum Club, and last year he was elected an Honorary Fellow of his old College. He will be greatly missed by a large circle of friends, to whom his quiet and unassuming manners greatly endeared him.

N.

NOTES.

THE freedom of the city of Edinburgh is to be conferred on Lord Lister on June 15.

THE annual ladies' conversazione of the Royal Society was held yesterday, as we went to press.

THE Prince of Wales will open the new buildings of the University Extension College, Reading, on Saturday next, June 11.

A FLORAL fête and children's floral parade will be held in the gardens of the Royal Botanic Society, Regent's Park, from 2 to 7 o'clock to-morrow (Friday).

THE city of Como, the birthplace of Alexander Volta, is preparing to worthily celebrate in 1899 the hundredth anniversary of the invention of the Voltaic or Electric Pile. To commemorate this important event, which has led to some of the greatest discoveries of the present century, there will be held at Como, from May 15 to October 15, an International Electrical Exhibition, to which will be annexed a national exhibition of the manufacture of silk—a branch of trade much developed in Como—and an international exhibition of the machinery, preparation, and process of working the same. Italian and foreign electricians are invited to a Congress, which will be held for the purpose of discussing the progress and applications of electricity. Como is a flourishing city on the main line of St. Gothard, and forty kilometres from Milan. It is pleasantly situated at the foot of the Rhaetian Alps, and on the shores of the most beautiful lake of Lombardy, to which it gives its name. An electrical exhibition ought to succeed in Italy, where the abundant hydraulic power greatly facilitates electric works. The application of electricity to the manufacture of silk must be of interest in Como, where the silk-works are of ancient date, and rapid progress is being made, though the industry is indebted to foreign countries for the machinery and implements. We are informed that foreign inventions will be greatly valued at the exhibition, and will be well placed. For the encouragement of exhibitors, the city of Como has decided to give a sum of 10,000 francs in prizes for new inventions in the field of electricity.

The title of the evening lecture which Prof. W. J. Sollas, F.R.S., will deliver at Bristol on September 9, at the meeting of the British Association, will be "Funafuti, the Study of a Coral Island." Mr. Herbert Jackson has chosen "Phosphorescence" as the subject of his evening discourse on September 12. Mr. W. Whitaker, F.R.S., will be the chairman of the conference of delegates of corresponding societies. Subscriptions to the local fund being raised for the expenses of the meeting now amount to 3665*l.*, and it is hoped that this will be increased to at least 4000*l.*

Our Paris contemporary, the *Revue Générale des Sciences*, has arranged with the Orient Steam Navigation Company, Limited, for the *Lusitania* to make a special cruise to Norway and the North Cape from July 15 to August 10. The boat will leave Dunkerque on the former date and proceed to Bergen, from which place it will go up the coast to the North Cape, calling at Trondhjem, Tromsoe, Hammerfest, and other places of interest. After viewing the midnight sun, the party will leave the North Cape on July 25, and will be taken down to Christiania, visiting many places on the way. Prof. J. Thoulet, professor of mineralogy and oceanography at the University of Nancy, and Baron Jules de Guerne, general secretary of the Société Nationale d'Acclimatation de France, will accompany the tourists, and will give short lectures, with lantern illustrations, on the various features of interest in the places visited. The programme is an attractive one, and provides a pleasant and instructive means of spending a holiday.

A valuable circular (No. 18), dealing with the physics of timber, has just been issued by Prof. B. E. Fernow, Chief of the Division of Forestry of the U.S. Department of Agriculture. The paper is given exceptional importance by the development of a formula worked out by Mr. S. T. Neely, showing how the strength of beams can be determined from the compression strength. In testing timber to obtain its various coefficients of strength, the test which is at once the simplest, most expedient, satisfactory and trustworthy is the "compression endwise test," which is made by crushing a specimen parallel to the fibres. All other tests are either mechanically less easily performed, or else, as in the case of cross-bending, the stresses are complex, and the unit coefficient can be expressed only by depending upon a doubtful theoretical formula. It is, therefore, of great practical value to have a relation between the cross-bending strength—the most important coefficient for the engineer—and the compression strength, and this is what Mr. Neely has found. His discovery is expressed in the following conclusion:—"The strength of beams at elastic limit is equal to the strength of the material in compression, and the strength of beams at rupture can be directly calculated from the compression strength; the relation of compression strength to the breaking load of a beam is capable of mathematical expression." This enunciation is of far-reaching importance, and a comparison if calculated with observed results given in the circular is convincing as to the efficiency of the formula. It is to be hoped that other and similarly successful scientific investigations into the physics of timber will be made in the U.S. Division of Forestry.

The mysterious phenomenon known as "Barisal Guns" or "Mist-poeffers" forms the subject of a useful paper by Dr. A. Cancani in the last *Bollettino* (vol. iii. No. 9) of the Italian Seismological Society. The observations on which his discussion is founded are collected from places in or near the inland province of Umbria, where the noises are known as "marina," it being the popular belief that they come from the sea. The sound is quite distinct and easily recognised; it is longer than that of a cannon-shot, and, though more prolonged and dull, it is not unlike distant thunder. It invariably seems to come from a distance and from the neighbourhood of the horizon, sometimes apparently from the ground, but generally through the air. The weather when the "marina" is heard is calm as a rule, but that it often precedes bad weather is shown by the common saying, "Quando tuona la marina o acqua o vento o strina." The interval between successive detonations is very variable, sometimes being only a few minutes, or even seconds. They appear to be heard at all times of the day and year, the experience of observers differing widely as to the epochs when they are heard most frequently. With regard to the origin of the "marina," Dr. Cancani concludes that they cannot be due to a stormy sea, because "mist-poeffers" are frequently observed when the sea is calm; nor to gusts of wind in mountain gorges, for they are heard on mountain summits and in open plains. If their origin were atmospheric, they would not be confined to certain special regions. Nor can they be connected with artificial noises, for they are heard by night as well as by day, and in countries where the use of explosives is unknown. There remains thus the hypothesis which Dr. Cancani considers the most probable, that of an endogenous origin. To the obvious objections that there should always be a centre of maximum intensity (which is never to be found), and that they are so rarely accompanied by any perceptible tremor, he replies that, in a seismic series, noises are frequently heard without any shock being felt, and of which we are unable to determine the centre.

The American Academy of Arts and Sciences have decided to award the Rumford Medal to Prof. James E. Keeler, director of the Lick Observatory, "for his application of the spectroscope to astronomical problems, and especially for his investigations of the proper motions of the nebulæ, and the physical constitution of the rings of the planet Saturn, by the use of that instrument."

The honour of Knight of the Order of the Polar Star has been conferred upon Dr. J. Scott Keltie by the King of Sweden and Norway.

Dr. R. Koch has been consulted by the East African Protectorate as to preventive measures against rinderpest, which is again rampant in the interior. Dr. Macdonald, the principal medical officer, and Veterinary-Captain Haslam, M.D., have visited Zanzibar to represent the Protectorate on this and other infectious diseases. Dr. Haslam will proceed to the seat of the disease, and direct preventive measures.

We learn from the *British Medical Journal* that the monument to Pasteur, which is to be erected in Paris in the space in front of the Pantheon, is now almost completed. M. Falguière, the sculptor, has introduced certain modifications into his original design, in which Pasteur was simply represented as overcoming Death, which was in the act of flight. Now a group of a mother with her child, thanking Pasteur, has been added on the right, while behind the central figure Fame is shown crowning him with laurels. The international subscription to the memorial now amounts to nearly 13,000*l.*

The Local Government Board, acting under the recommendations of recent Commissions as to the cultivation in glycerine of vaccine lymph before such is applied to the human body, has (says the *Times*) leased a large laboratory and several office rooms at the British Institute of Preventive Medicine, on the Thames Embankment, for the purpose of cultivating the lymph. The bacteriological expert who has been appointed to take chief control of the new laboratory is Dr. F. Blaxall, lecturer on bacteriology at Westminster Hospital. He will have an assistant, who has already been nominated, and an efficient staff. The calves from which the vaccine lymph is taken will be kept for the present at the Government calf establishment near the Foundling Hospital, and the lymph will be taken thence to the Thames Embankment in its pure state to be prepared and stored in glycerine.

We regret to announce that Mr. Henry Perigal, the treasurer of the Royal Meteorological Society, died on Monday at the advanced age of ninety-seven years. Mr. Perigal was the author of various works on astronomy, bicycloidal and other curves, kinematics and the laws of motion, probable mode of constructing the Pyramids, &c. He was a constant attendant at the meetings of various London scientific societies until within two years of his death. He was a Fellow of the Royal Astronomical, Royal Microscopical, and Royal Meteorological Societies, as well as a member of several other scientific associations.

The *Times* announces the death of the Rev. Percival Frost, F.R.S., on Sunday last, in his eighty-first year. Born at Hull, he was educated at Beverley, Oakham and Cambridge, where he was second wrangler and first Smith's prizeman in 1839, Fellow of St. John's College from that year until 1841, mathematical lecturer at Jesus College from 1847 to 1859, mathematical lecturer at King's College, Cambridge, from 1859 to 1889. He had been a Fellow of King's College since 1882, and was elected a Fellow of the Royal Society in 1883. Dr. Frost was the author of treatises on "Curve Tracing," "Solid Geometry," "The First Three Sections of 'Newton's Principles,'" as also of numerous papers published in various mathematical journals.

Sir Robert Rawlinson, K.C.B., eminent by his works in civil and sanitary engineering, died on Tuesday, May 31, at the age of eighty-eight. He was a vice-president of the Society of Arts, and from 1849 to 1888 was chief engineering inspector of the Local Government Board. He took a foremost part in the development of sanitary science, and as a member of the Army Sanitary Commission in the Crimea was able to vindicate the soundness of his sanitary teaching. The beneficial results obtained by the Commission led to increased attention being paid to sanitary requirements, and thus brought about a very great reduction in the annual mortality of the British Army. Sir Robert Rawlinson acted as chairman of the Royal Commission on the Pollution of Rivers in 1866, and also served on the Commission which inquired into the sanitary condition of Dublin in 1879. He became a member of the Institution of Civil Engineers in 1866, and president in 1894. At one period he took a considerable part in the proceedings of that body, discussing mostly questions connected with drainage and water supply, of which his official position gave him a wide experience.

It has already been announced that the autumn meeting of the Iron and Steel Institute will take place at Stockholm on Friday and Saturday, August 26 and 27 next. Particulars of the special transport arrangements, which have been made for the convenience of members attending the meeting, have now been issued. A special steamer, of over 3000 tons, chartered by Dr. H. S. Lunn and Mr. Woolrich Perowne, will leave Newcastle-on-Tyne on Wednesday, August 17, and will proceed by way of the Baltic Canal, Kiel and Wisby to Stockholm, where she will lie, and serve as a floating hotel, from Thursday, August 25, to Sunday, August 28. The return journey will be by way of Copenhagen, Gothenburg and Christiania. Dr. Lunn and Mr. Perowne have also arranged for the S.S. *St. Sunniva*, a one-thousand ton boat, to leave Leith on Saturday, August 20, proceeding by way of Christiania to Stockholm, where she will lie on Friday, Saturday and Sunday, August 26, 27 and 28, proceeding from Stockholm to St. Petersburg, and returning by way of Copenhagen and the Baltic Canal. The Orient Steam Navigation Company, Limited, have re-arranged the itinerary of their pleasure cruise No. 3 to the Baltic, so as to bring their S.S. *Lusitania* (3912 tons) to Stockholm on Thursday, August 25, and to keep her there until Sunday, August 28. The itinerary includes visits to Copenhagen, Wisby, Stockholm, Kronstadt, St. Petersburg, Kiel, and the Baltic Canal. The Great Eastern Railway Company has promised to afford special facilities to members travelling by the Continental route. The arrangements which are being made by the Local Reception Committee for the instruction and pleasure of the members, and the ladies accompanying them, are making satisfactory progress, and the detailed programme will be issued in due course.

In view of the forthcoming conference of representatives of Sea Fishery Committees convened by the Board of Trade, a preliminary meeting of the representatives was held on Tuesday at the Guildhall, Westminster, to obtain a consensus of opinion on the subjects which are to be considered. It was resolved that a deputation should urge on the Government the need of legislation to protect immature sea fish and the enlargement of the powers of Sea Fishery Committees. A resolution was also carried in favour of the formation of an association of Fishery Committees.

The Belgian Government having decided to offer a premium of 50,000 francs to the inventor of a paste for matches which will be free from white phosphorus and which will ignite on cloth or any other surface, a Ministerial decree has been issued determining the conditions. The competition will be international in character, and will remain open until January 1, 1899. Communications on the subject are to be addressed to M. Woeste, the president of the Commission appointed to adjudicate, at 2 Rue Laterale, Brussels.

Herr N. A. Möller, in Eberswalde, has sent us a communication in which he states that he has undertaken a labour of love which will not be easy unless he is helped by many who are in the position to assist him. Fritz Müller, the naturalist, an old friend of his, died in Brazil, and Herr Möller wishes to raise a monument to his name by publishing a work which will contain an account of his life, character, method of work, his most important letters, and if possible his most valuable scientific writings. With this intention Herr Möller requests all those of our readers who possess any manuscripts, letters, &c., which may be found useful in such a biography, to forward them to him in Eberswalde, where they will be taken the greatest care of and returned when finished with.

A syllabus prepared by Mr. R. De C. Ward, containing an outline of requirements in meteorology, intended for use in preparing students for admission to Harvard College and the Lawrence Scientific School, affords evidence that careful and systematic work in meteorology is given more encouragement in the United States than it receives here. The scheme of work indicated in the syllabus will train the student to scientific methods of investigation, and will make him to some extent a thinker and investigator on his own account.

In our issue of April 8, 1897 (vol. lv. p. 542), we drew attention to an important investigation by Dr. O. Pettersson, with the object of showing that certain relations existed between the behaviour of the Gulf Stream and the subsequent general character of the weather over Europe, the results of which were based upon observations made during about twenty years at three stations on the Norwegian coast. In the *Meteorologische Zeitschrift* for March last, Dr. W. Meinhardus, of Berlin, continues the investigation in an article entitled, "On some

Meteorological Relations between the North Atlantic Ocean and Europe during the Winter Half-year," based upon a much longer series of observations. The results confirm those of Dr. Pettersson in a very satisfactory way, and show that a good idea of the temperature over a large area may be predicted with a considerable probability of success, and that, generally speaking, a high (or low) temperature of the Gulf Stream on the Norwegian coast in the first part of the winter (November to January) is usually followed by a high (or low) air-temperature in Central Europe in the latter part of the winter (February to March) and the early spring (March and April). It will be seen that the investigation refers entirely to the winter months.

Mr. H. Parker gives, in the *Ceylon Observer* of May 12, a detailed account of the abnormal rainfall of 31·72 inches in twenty-four hours, experienced at Nedunkeni, in the Northern Province of Ceylon, last December, and already briefly described by a correspondent in these columns (p. 78). Nedunkeni, eleven miles down the southern road to Mullaittivu, and 122 feet above sea-level, is a small village a little to the east of the dividing ridge of North-Central Ceylon, and though itself in the catchment area of the eastern Per Aru, which flows through Tannir Murippu Tank, it is only a little to the south-west of the point where three separate drainages meet. Forest, containing a thick growth of high trees, extends over the neighbourhood, and more especially for many miles from the south to the east. For about three years a rain-gauge has been established in the grounds of the dispensary in the village, and its records are regularly transmitted to the Public Works Office, and are published among the rainfall returns. Although the mean annual rainfall at Nedunkeni is probably little more than 50 inches, the fall for last December was 67·07 inches, and of this amount 31·72 inches were measured at 9.30 a.m. on December 16 as the rainfall of the preceding twenty-four hours. From an examination of the position of the rain-gauge, and the testimonies of the observers, Mr. Parker concludes that most probably the actual rainfall was in excess of the recorded amount.

Weather influences on farm and garden crops are discussed in an interesting address by Mr. Edward Mawley, published in the *Quarterly Journal* of the Royal Meteorological Society (April). After giving a short sketch of the climate of the British Isles as a whole, Mr. Mawley considers separately some of the effects produced on vegetation in this country by varying temperatures, by scanty and heavy rains, by sunshine and by wind; and afterwards treats of the leading farm and garden crops, and their special requirements with regard to atmospheric conditions. The paper should be of service in showing how intimate the connection is between meteorology, agriculture and horticulture.

Mr. T. Mellard Reade informs us that a very large boulder of gypsum has been uncovered by the excavations in the brickworks of Mr. Ed. Peters, Cooks Lane, Great Crosby, near Liverpool. It is embedded in and completely surrounded by a thick bed of brown boulder clay, the bottom of the boulder being about 17 feet below the surface of the ground. The boulder measures 11 feet by 6 feet by 6 feet extreme dimensions, and weighs about 13 tons. "Small pieces of gypsum and plates of selenite are," adds Mr. Reade, "not uncommon in our boulder clays; but this individual boulder not only far surpasses in size any drift fragments of gypsum hitherto found, but is actually the largest boulder of any sort that I have seen taken out of the boulder clay, or recorded from it in the neighbourhood of Liverpool."

It is known that a function of two variables x and y may have a maximum or minimum value along every straight line passing through a certain point O without the function necessarily being itself a maximum or minimum at that point. A simple proof that the same cannot be the case if the function is a maximum at O, not only for all *straight* lines, but also for all continuous lines through O, is given by Signor G. Vivanti in the *Atti de Lincei*, vii. 8.

The Royal Academy of Sciences of Naples has hitherto been supposed to have originated about the year 1732, but from a communication published in its *Rendiconto*, by Prof. Federico Amodeo, we learn that the foundation of the Academy has been traced back thirty-four years earlier. In 1698, under the Viceroy, Luigi della Cerda, Duke of Medinacoeli, there was founded, in Naples, a literary and scientific society called the Palatine Academy; this society appears to have been overlooked by historians, owing to the fact that no published writings of its members had come before their notice. Prof. Amodeo has now succeeded in discovering a number of printed papers, notably two scientific works of the mathematician Antonio Monforte, affording abundant proof of the existence and activity of this, the parent of the present Academy, which thus dates from the year 1698.

Prof. P. de Heen continues his researches on so-called "infra-electric" radiations in the current number of the *Bulletin de l'Académie royale de Belgique*. The author is led to the conclusions that every source of disturbance in the ether gives rise not only to known radiations, but also to other rays vibrating in a different manner. These rays have the same properties as Röntgen rays in the matter of their action on dielectrics, charged conductors and electric fields, and differ from them in the matter of wave-length. They are absorbed so much more readily than ordinary light waves, that any such rays which emanate from the sun are completely sifted out by our atmosphere. In accordance with M. Perrin's views, the discharge of a conductor by these rays is chiefly due to their action on the lines of force. Lastly, an electric field is found to behave towards infra-electric rays as an opaque medium.

An extremely simple commutator for converting an alternating current into a direct one is investigated by Signor A. Dina (of Zürich) in the *Rendiconti del R. Istituto Lombardo*, xxxi 9. From the experiments of Prof. Grätz (of Munich) and Herr Pollak (of Frankfort), it appears that an aluminium element capable of evolving oxygen at the anode produces a remarkable weakening of the current, and if the electromotive force is less than 22 volts, practically no current flows; but if the pole in question is made the kathode, no perceptible change in the current takes place, the electromotive force of the element being less than 1 volt. Hence it is easy, by arranging such elements in series, to obtain a combination which will only allow currents to pass in one direction, and which will resist any required electromotive force in the opposite direction. From experiments now described, the present writer concludes that the action of the elements is similar to that of a condenser, the aluminium becoming coated with a film of oxide which plays the part of dielectric. Signor Dina has not succeeded so far in putting the method to any practical use, though Herr Pollak claims to have done so.

A series of experiments on the action of opaque tubes on Röntgen rays passing down them is described by Prof. Villari (*Atti dei Lincei*, vii. 8, and *Rendiconto dell' Accademia di Napoli*, iv. 3, 4). In a series of previous experiments, Prof. Villari found that in traversing a long tube opaque to them, these rays lose a large part of their power of discharging an electrified conductor at the end of the tube. This effect the author now attributes to the action of the tube in cutting off lateral rays, which, by their action on the surrounding air, would accelerate the discharge. In the matter of photographic action, Prof. Villari finds no difference between rays which have passed through a tube and those which have not, and he concludes that Röntgen rays are neither reflected nor diffused by the walls of the tube, and that the transmitted rays are probably in no way modified by its presence.

MR. ERNEST HOSE communicates to the *Sarawak Gazette* for May some observations on an encounter between a python and wild pigs in the jungle at Tambak. A young pig had been seized by a large python, and the cries of distress summoned about twenty of the herd to an attack. They gored the python savagely with their tusks, and so harassed and lacerated it as to force it to relinquish its prey. The python was ultimately killed by Mr. Hose.

AN interesting note on Chinese antiquities is given in the consular report on Shashih (C. 8648-108 of 1898), just issued. Shashih contains a pagoda dating, it is said, from the ninth century, and there are other remains. There are distinct traces of the town having been at one time fortified, the earth nucleus of a wall and six brick gateways being still visible. The place is one of considerable interest to the archæologist and student of ethnography. All round Chingchou, which is about two miles from the north-west extremity of Shashih, are mounds, earthworks, look-out terraces, &c., the remains of ancient cities and fortresses, which mark the sites of successive capitals and strongholds of the ancient kings of Ch'u and their local successors from the very dawn of authentic history. These remains are not described in the report, but it is stated that the traditions attached to them cluster round the capture of the capital of Ch'u by the Prince of Ch'in in 278 B.C., its destruction as an independent kingdom half a century later, the part it played in the wars of the second and third centuries A.D., and the momentary revival of independence in the tenth century as the principality of Nan P'ing.

ANOTHER report on China, very important for commercial purposes, "Trade of Central and Southern China" (C. 8649-29 of 1898), contains some geographical and other notes of interest, together with maps. K'uei Fu is interesting as one of the oldest sites of Chinese occupation in these parts, dating from the beginning of our era. Geographically it marks the point of junction of the limestone mountains, athwart which the Yang-tze has forced a way in 100 miles of rapids and gorges, and the red sandstone formation of Ssŭ-ch'uan. A mile beyond Tzŭ-t'ung-chen there is a once-renowned Buddhist temple, and still noteworthy for its gigantic figure of Buddha, about 80 feet high, 5 feet across the toes of one foot, cut in high relief out of the solid rock and overlooking a bad rapid in the river, over which it is thought to have a sort of divine superintendence. Though cut in A.D. 1126, it is still in excellent preservation, and evidently much respected. The temple on the bluff behind the image was once on a grand scale, but it has been allowed to fall into utter ruin. In the region beyond this is the plain of Sui-ning, composed of solid alluvium 30 feet deep. There are frequent little temples to the god of the soil, usually of solid stone, the image being enclosed by open fretwork, so that the god cannot see out. The city of Ch'êng-tu is defended by huge walls and gates. The first wall was built in the third century B.C., shortly after the Chinese reduced the old aboriginal state of Shu, and began to colonise this country; the present wall was built in 1784, and is really a magnificent structure, and in almost perfect preservation. Opposite the city of Chia-ting has been cut in high relief a huge figure of Maitreya Buddha, no less than 380 feet high. Between Hêng-chiang and Lao-wa-t'an is the territory of the independent people Lolo, a race akin to the Thibetans, and perhaps the Burmese, who peopled these parts before the Chinese, and whom the latter have never subdued, although they have been attempting the enterprise for nearly 2000 years. The eastern part of the Red Basin was early peopled by the Chinese race, and in the third century A.D. Ch'eng-tu was the capital of the western of the three kingdoms into which China was then divided. At the end of the Ming dynasty (1640) the inhabitants were destroyed in one of those social cataclysms that have occurred with much regularity every few hundred years in Chinese history. When order was restored by the present dynasty, the province was colonised chiefly from Hupei and Hunan on the east. Altogether this is a most interesting report; and though intended for trade, the ethnographer and geographer will obtain many useful notes therefrom.

UNDER the title of "The Adulteration of Dairy Produce," Mr. R. Hedger Wallace has brought together a mass of statistics relative to the quality of the articles which come under the above head. The author's original paper was read before the Royal Scottish Society of Arts in Edinburgh, and it constitutes a formidable indictment against the conduct of dairying both at home and abroad. The butter we import is apparently frequently shamefully adulterated. The reputed pure Normandy and Brittany butters, we are told, for example, have been found to contain as much as from 30 to 40 per cent. of margarine; and not only is this latter material employed to swell the volume of first-class butter exported to this country from these districts, but butter of inferior quality is imported from Central France, Italy, and even Australia, to be *blended* and forwarded to us as the best Normandy and Brittany butter. Another plan consists in importing Belgian butter, which enjoys a by no means high reputation, and then shipping it from Calais to England as Normandy butter, whilst Australian butter is also *worked up* to sell in London under the Isigny mark, a noted brand of Normandy butter. In the space of a little over two years it appears that of the samples of butter taken at port of entry into this country and analysed, 10½ per cent. of the Dutch samples were adulterated, 2 per cent. of the Danish, 19 per cent. of the German, 5½ per cent. of the Norwegian, and 7 per cent. of the Russian. Unfortunately such adulteration is not confined to our friends across the Channel, and the practice of working up butters, as it is called, is carried on at home as well. It is clear that such extensive adulteration, as Mr. Wallace assures us goes on in the butter trade, ought to be energetically dealt with by our public authorities. Another important matter discussed by the author is the use of antiseptics or preservatives to milk, technically known as "drugging" the milk. We know that the addition of chemicals to milk as preservatives is prohibited in France on the grounds of unwholesomeness; cannot we induce responsible officials in this country to bring this matter to the notice of the Government, and have such treatment of milk included under the head of adulterants? The New York law on dairy products, passed in 1893, enacts, among other things, "that milk is adulterated to which has been added, or into which has been introduced any foreign substance whatever." Surely it is time steps were initiated, if not by authorities responsible for the purity of our food supplies, then by the public themselves, to put a stop to so reprehensible a practice.

As contributions to our knowledge of the Flora of India, we have received reprints of the tenth portion of the materials for a Flora of the Malayan Peninsula by Dr. George King, and of a paper on some new Malayan orchids by Dr. G. King and Mr. R. Pantling.

IN the *Kew Bulletin* No. 132, Mr. George Massee has a note on the obscure disease which is often very destructive to young fruit trees, known as "slime-flux." Mr. Massee attributes the injury to the combined attacks of a Schizomycete, *Micrococcus dendroporthes*, and of the aquatic condition of a fungus *Torula monilioides*. The *Micrococcus* is the active agent in producing fermentation, but can enter the tissues of the plant only through injuries in the bark.

THE additions to the Zoological Society's Gardens during the past week include a Servaline Cat (*Felis servalina*), a Serval (*Felis serval*) from Uganda, presented by Mr. Francis G. Hall; a Greater Sulphur-crested Cockatoo (*Cacutua galerita*) from Australia, presented by Mr. P. G. Dupuch; two Golden Eagles (*Aquila chrysætus*), European, presented by Edgar Baxter; a Yellow-billed Sheathbill (*Chionis alba*), captured at sea, presented by Captain H. W. Schlemann; a Bean Goose (*Anser secetum*), European, presented by Mr. W. H. St. Quintin; two Egyptian Kites (*Milvus ægyptius*) from Congoland, presented by the Rev. R. H. C. Graham; a Common Viper (*Vipera berus*) from Cornwall, presented by the Rev. John Harris; a Burchell's Zebra (*Equus burchelli*, ♂) from South Africa, deposited; two Black Hornbills (*Lophoceros nasutus*) from West Africa, a Yarrell's Curassow (*Crax carunculata*) from South-east Brazil, a Guan Ortalida from South America, a Double-ringed Turtle Dove (*Turtur bitorquatus*) from Java, purchased; an English Bull (*Bos taurus*) born in the Gardens.

Erratum.—In the classification of Bacteria given in the review of Prof. Migula's work on "Systematic Bacteriology," which appeared in last week's NATURE, the term "genus" should be substituted for "species."

OUR ASTRONOMICAL COLUMN.

THE COMPANION TO PROCYON.—As is well known Prof. Schaeberle discovered in November 1896 a companion to Procyon, which he suggested would prove the theoretical companion predicted by Bessel. This difficult object—difficult on account of its nearness to Procyon, not by reason of its faintness—has been satisfactorily observed at the Yerkes Observatory, thus confirming Prof. Schaeberle's measures, the motion of the object, and its suggested identity with Bessel's companion. We have now the following measures:

1896, November ... P = 318·8 ... D = 4″·59
1897, October ... P = 324·1 ... D = 4·70
1898, March ... P = 326·0 ... D = 4·83

Prof. Barnard, who reports the observation, says that when the seeing is good, the companion star is a very conspicuous object and easy to measure with the bright star in the field unobscured. It was estimated to be one magnitude fainter than the old companion, which is of about the twelfth magnitude. This description, however, scarcely agrees with that of Prof. Schaeberle, who states that he made a measure of the star in November 1897, ten minutes before sunrise, and when looking along the outside of the telescope Procyon was no longer visible in the sky. This would imply that the comes was brighter than the thirteenth magnitude, and therefore more observations may be anticipated.

THE LIVERPOOL OBSERVATORY.—We have received the annual report of the director of the Liverpool Observatory, and are glad to see that he is making some attempt to break away from the mere meteorological observations, which have so long held sway at this observatory. The present attempt is a very small one, consisting merely in the observation of the Right Ascension of some of the circumpolar stars that Prof. Auwers has suggested should be continuously observed, with the view of affording more frequent opportunities, and more accurate determinations of the azimuthal error of transit instruments. Cometary observations have always formed a part of the routine work of this observatory, since the appointment of the present director. These are still being actively prosecuted, when the brightness of the comet permits. We notice also that the observatory is taking some part in the inquiries that are now going on in seismometry and the physics of the earth's crust.

SUNSPOT PERIODS AND NATURAL PHENOMENA.—In an article entitled "Le Soleil et la Nature" in the *Bulletin de la Société Astronomique de France* for June, M. Camille Flammarion brings together some very interesting data concerning the connection between the sunspot period and the yearly return of swallows, cuckoos and nightingales, and the flowering of chestnuts and lilacs. The observations have been extended over several years. In the case of the chestnuts and lilacs, M. Flammarion himself commenced the series in the year 1871, and not only observed the same trees every year when they began to bud, but employed the same scale of observation from the first; the observations are thus homogeneous throughout. In the remarkable series of figures accompanying the article, M. Flammarion has grouped together the observations of three years, and plotted curves which undoubtedly suggest a connection between one another, and with that representing the number of spots on the sun. Further, when spots are most numerous migratory birds return to any one place earlier in the year than usual, and when spots are at a minimum they do not come back until a much later date. In the case of swallows this is very remarkable, as observations of their time of return have been made since 1853, a period of forty-five years. The curve has a period of about eleven years, and the times of the maxima and minima correspond well with those of the sunspot curve.

Another curious fact M. Flammarion points out is that the curves showing the temperature of the months of March and April and the mean temperature of the year are nearly identical for the period covered by the years 1876-97.

DOUBLE AND MULTIPLE SOUTHERN STARS.—On April 28 of this year we noted in this column that Dr. T. J. J. See had published in the *Astronomical Journal*, Nos. 431-432, some details of his plan of double and multiple southern stars, and the first part of a catalogue of new double stars. In the current numbers of the *Astro. Nachr.* (Nos. 3495-6) he publishes a further catalogue containing the measures of those systems made at the Lowell Observatory during the past year and four months. In many instances these measures are the first that have ever been made, and on that account a great part of the accompanying results possess a degree of interest equal to that of the first measures of new double stars. Messrs. W. A. Cogshall and S. L. Boothroyd have ably assisted Dr. See in this work.

THE ROYAL OBSERVATORY, GREENWICH.

ON Saturday last (June 4) the Astronomer Royal presented his annual report to the Board of Visitors of the Royal Observatory, Greenwich. As usual the numerous guests numbered among them many astronomers and other men of science; and the weather, though at times threatening, proved sufficiently fine to allow the buildings and instruments to be comfortably inspected. The following brief *résumé* is taken from the report:—

Buildings.

The buildings on the south side of the grounds, which form part of the new physical observatory, are now approaching completion, having been delayed somewhat by a failure in the supply of terra-cotta. Up to the present time the construction of the magnetic pavilion has not been commenced, although provision has been made for it and a good site selected. It is hoped that this will no longer be delayed, for the amount of iron recently used in the construction of the new physical observatory has a very decided effect on all the magnetic instruments in the old buildings. For some months past we have noticed a scaffolding outside the dome of the 28-inch. This we read was put up in February last in preparation for erecting a balcony round the building, but the plans were subsequently reconsidered and modified, and the work in consequence delayed. The electric light and telephone communication has been extended to the new buildings, and a new accumulator house is being constructed in the basement on the north-east side of the physical observatory to replace the shed in which they are now located.

Transit Circle.

A diagram on the wall of the transit room showed a curve which had been plotted, the points in the curve representing the number of R.A. observations and circle readings for each year from 1877. A glance at this curve showed that the number of transit observations during the more recent years has increased by leaps and bounds, and where in place of the usual 4000 observations per year in 1877-80, the number now has reached the figure 11,000. This year the transits, counting separate limbs as one observation, amount to 11,441, excluding determinations of collimation error 297 and level error 651. The circle readings were 10,626. The correction for the R.D. discordance